



Manual for Klinke's Mackie Control Universal REAPER extension

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1 Introduction

Welcome to the manual for the CSurf_MCU_Klinke Extension for REAPER (v3.6 or higher). This extension enhances support for the Mackie Control Universal (MCU) controller, but can also be used for other controllers that use the MCU protocol (please read the manual of your controller to check if and how your controller supports this protocol). In addition, the extension also supports the Behringer BCF2000 and BCR2000. tehsux0r has written a setup guide for the BCF2000 that can be found [here](#) and nofish wrote a setup guide for the BCR2000 that can be found [here](#).

CSurf_MCU_Klinke is released under the GPL 2 licence, for details check section 11.

1.1 Limitations

- CSurf_MCU_Klinke only runs under Microsoft Windows, no OS X version exists and none is planned from my side. However, the source code is open to everyone and most parts are based on the cross platform library JUCE, so if anyone wants to try to port the extension to OS X, this should be feasible (and I will try to support them as much as possible).
- The extension does not support the Mackie Control Extender (MCE), and also not more than two controllers at the same time in general. Also the support of a second controller is already a hack as described in section 2.2.

If you have a MCE and think it is more important to use the extender than the new features in v0.8, you can still download the older v0.6 from here: <http://tinyurl.com/67qjt6y>.

1.2 New in v0.8

The most important changes in v0.8:

- [2nd controller hack](#) (since v0.8.3)
- [Button-emulating actions](#) (since v0.8.2)
- REAPER folders can now be reflected on the MCU using the [Folder-Mode](#)
- Anchors allows locking a Channel Strip to a fixed track
- [FX presets](#) (store and recall FX settings) including a Blind Test feature
- [FX Local maps](#) (different maps for each FX instances of the same FX)
- improved syncing of the MCU state with the REAPER GUI
- [Global Actions](#) assignments can be named and shown in MCU display
- [Quick Jumps](#) added for faster navigation
- improved [Track Name](#) handling
- FX favorites can be stored in REAPER project file

1.3 Known Issues

- On some computers the MCU freezes after REAPER is started and some buttons are pressed. This problem disappears automatically after a few minutes or by touching one of the faders several times (until you see that the display reacts to the touch, e.g. shows the dB value of the track).

1.4 Donations

Writing the plugin was a lot of work (but also fun most of the time), writing this manual too (without the fun part). So acknowledgments in the form of donations are welcome and can be made via PayPal. To donate click [here](#) or on the Donate button in the Control Surface Settings dialog. If your DAW does not have an internet connection, you can also send the donation via PayPal manually to klinkenstecker@gmx.de. But I am also delighted when I get positive feedback via email or the REAPER forum ;-)

1.5 Credits

I want to thank:

- Kathrin for proof-reading the v0.8.0 manual and being such a great hiking companion
- Justin for always improving the REAPER API when I need additional features (and of course REAPER in general)
- Chris Doerman (cdoerman) for his Overlay (see section 9), FX maps (e.g. take a look at the hugh Pod Farm map, it's an amazing piece of work) and his great help during beta-testing
- Ryan (yagonnawantthatcowbell) and Curvespace for contributing so many FX maps
- axelsk for the Oxford FX maps
- musicbynumbers for the [Behringer BCF2000 setup-guide](#) and a lot of help on the BCF2000 mode
- tehsux0r for the even more extensive [Behringer BCF2000 setup-guide](#)
- nofish for the Behringer [BCR2000 setup guide](#)
- Jason (Drumbum), Miquel (anticlick), Alison and JosMuysers for beta-testing
- Jules for the great JUCE library

2 Installation

The current version of the extension can be downloaded from https://bitbucket.org/Klinkenstecker/csurf_klinke_mcu/downloads.

To install the extension download unpack the zip-archiv in the plugin directory of REAPER. Afterwards the folder with the original `reaper_csurf.dll` file should also contains four new `reaper_csurf_mcu_klinke` dll-files, this manual and a new folder named MCU. This MCU folder contains default configuration files and FX maps. Do not modify them. Your own configuration files and FX maps are stored in the folder `My Documents\MCU` that is created when you start the CSurf_MCU_Klinke surface for the first time.

To activate the extension you need to follow these steps:

- open the REAPER preferences
- scroll down and select "Control Surfaces"
- if the original "Mackie Control Universal" surface was added, remove it
- add the "Mackie Control (Klinke)" surface

- in the case that the controller is connected via USB: increase the “Control surface display update frequency” in the Control surfaces preferences of REAPER to 30 Hz.

For the [Action-Mode](#) it is useful to import Action shortcuts:¹

- open the [Actions dialog](#) in REAPER (e.g. by pressing the '?' key)
- press the Import/Export button on the lower left corner and select "Import..."
- in the appearing file-dialog, select the file `... \Reaper\Plugins\MCU\DefaultActions.reaperKeyMap`.

2.1 Control Surface Settings Options

There are four options in the Control Surface Settings dialog that can be activated (the later three are useful for owners of the Behringer BCF2000 and maybe other controllers as well):

- Swap left/right arrow on zoom: By default the left arrow key zooms out of the arrangement and the right arrow button zooms in (assuming zooming is activated via the ZOOM button). This can be swapped.
- No level meter: Do not show the level-meters in the Pan-Mode, always show the dB values instead (the bcfview Application does not support the level-meters protocol, so for BCF users it is useful to choose this option).
- Use keyboard modifier: The Behringer BCF does not have OPTION/CONTROL and ALT modifier buttons. When this option is selected, the keyboard modifier can be used instead. The left ALT key substitutes the ALT button, the right ALT key the OPTION button.
- Fake fader touch: The BCF2000 does not have fader touch sensitive faders, so after a fader movement the extension simulates that the fader being touched for an additional 2 seconds.

2.2 2nd controller (Mackie Control B)

If you try to add a second controller using the “Mackie Control (Klinke)” entry in the Control Surfaces dialog, you will get an error message that tells you that a second instance of the extension can not be added.

As a workaround I built a “B” extension which runs completely independent, e.g. the settings in the [Track Settings Editor](#) are not shared. The only “communication” between both extensions are happen through REAPER, e.g. if you select a track with one controll surface, REAPER will tell the other one that a new track was selected. But it’s important to keep in mind that an extension can also modify the tracks that are shown in the REAPER mixer (see [7.1.7](#) for details). If both extensions try this at the same time, this can cause a chaotic behaviour, so you must enable this options for only one of the extensions.

To activate a second extender you need to follow the steps described aboved for the first extender, the only difference is that the “Mackie Control B (Klinke)” surface must be selected.

¹If you want to assign all actions by yourself there is need to import anything, but the predefined actions can be useful to understand the features described in the [Action-Mode](#) section.

3 Overview



Figure 1 shows the MCU hardware and how its elements are partitioned:

- The Channel Strip section is highlighted in blue, it includes the MASTER FADER and the FLIP, GLOBAL VIEW, NAME/VALUES and FADER BANKs buttons). This section can be set in different modes, which allows controlling the REAPER mixer (including sends), editing FX parameters and triggering REAPER actions. Details are described in section 7.

- The F1-F8 buttons (in the read area) can be used to store and recall Markers, Time Regions (OPTION) and Loops (ALT). Pressed in combination with the CONTROL modifier, the corresponding element is stored. For details see section 5.
- The buttons in the Global View (green) area can be used to trigger REAPER actions. Those assignments are independent of the Channel Strip mode.² Details are described in section 6.
- The Transport section (yellow area) highlights all controls that can be used to change the EditCursor, the Loop or the Time Region, and those that start/stop playback and recording. Details are described in the following section.
- The remaining buttons are described in the Misc section, apart from the Automation and Utilities buttons which should be self-explanatory.

4 Transport

For the Transport and also the [Regions and Markers](#) section the modifier buttons have some common usage, CONTROL is used to store stuff (this is always the case if something can be stored), OPTION is used if the Time Region should be modified³ and ALT is used for the Loop selection⁴. In the event that something corresponds to the time signature, SHIFT can be used to select beats instead of bars.

4.1 PLAY, STOP and CANCEL

- STOP: Stop the playback and jump to the EditCursor
 - while recording: Stop and save all recorded media
 - * ALT: Stop and show Dialog
 - Double-click: Set the EditCursor to the nearest bar⁵
 - * SHIFT: Set the EditCursor to the nearest beat
 - * OPTION: Set Time Selection start/end to the nearest bar
 - * SHIFT OPTION: Set Time Selection start/end to the nearest beat
 - * ALT: Set Loop start/end to the nearest bar
 - * SHIFT ALT: Set Loop start/end to the nearest beat
- CANCEL: Stop and delete all recorded media
- PLAY: Start the playback
 - while playing: Stop at current play position
 - ALT: Create a Loop around the EditCursor with a length of 1 bar and play this loop
 - SHIFT ALT: Create a Loop around the EditCursor with a length of 1 beat and play this loop

²Additional actions can be assigned in the [Action-Mode](#) of the Channel Strip section.

³If there is a difference between Time Region start and end, SHIFT is used to select the start and OPTION to select the end.

⁴If there is a distinction between Loop start and end, OPTION is used to select the start and ALT to select the end.

⁵Time Signature changes are ignored.

4.2 Jog Wheel

The Jog Wheel's behaviour can be modified with the MODIFIER buttons:

- SHIFT: move Time Region start
- OPTION: move Time Region end
- CONTROL: move Loop start
- ALT: move Loop end

The movement depends on the Zoom level and the status of the SCRUB button. If SCRUB is off, the position will move one bar or beat, if SCRUB is on, the position will be moved by the time that is equivalent to two pixels in the REAPER GUI.

4.3 REWIND and FFWD

The REWIND & Fast Fwd (FFWD) Button can be set in Mode "Normal", "Marker" or "Nudge" (note that the Nudge Mode has not been implemented). When REWIND or FFWD is pressed in combination with the MARKER or NUDGE button, the MCU will automatically switch back to the original mode after you release the MARKER/NUDGE button.⁶

4.3.1 Normal-Mode

- REWIND/FFWD: move EditCursor 1 bar backward/forward. The REWIND/FFWD buttons can be held down for continuous movements.⁷
 - SHIFT: move EditCursor 1 beat backward/forward
 - CONTROL: Goto Project start/end
 - OPTION: Goto Time Selection start/end
 - SHIFT/OPTION: Set Time Selection start/end to the EditCursor position
 - ALT: Goto Loop start/end
 - SHIFT/ALT: Set Loop start/end to EditCursor

4.3.2 Marker-Mode

- REWIND/FFWD: Previous/Next marker
 - OPTION: Previous/Next Region as Time Selection
 - SHIFT OPTION: Swap Time Selection to left/right
 - ALT: Previous/Next Region as Loop
 - CONTROL ALT: Swap Loop to left/right

⁶The same mechanism works for the VPOT ASSIGN buttons in the [Channel Strip modes](#).

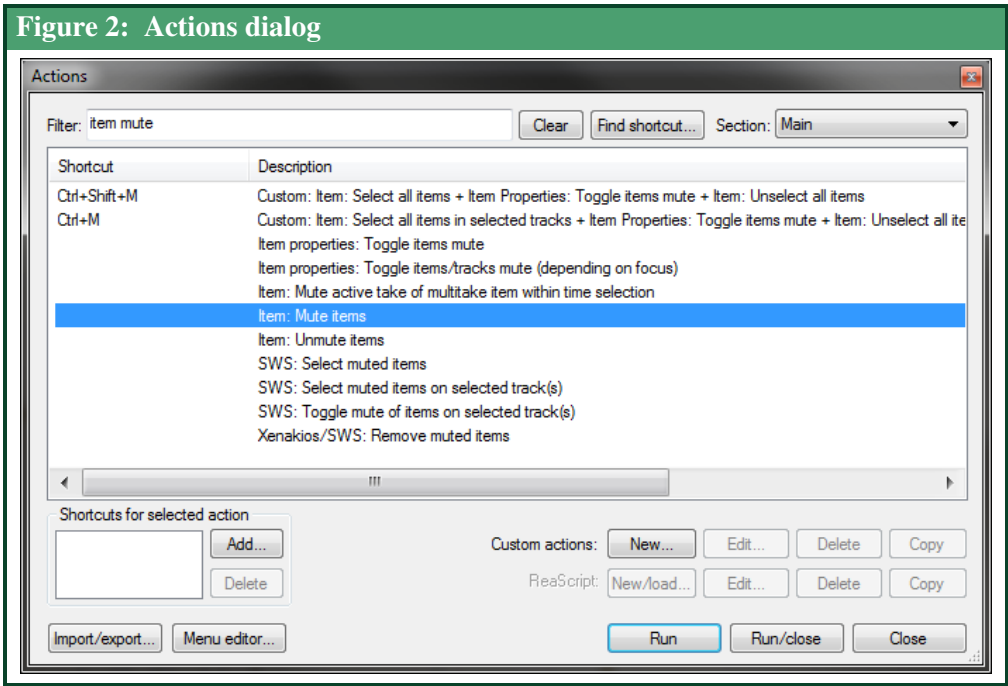
⁷The maximum speed of the movement depends on the Control surface display update frequency which can be set in the preferences.

5 Regions and Markers (F1-F8)

- F1-F8: Select Marker 1-8
 - CONTROL: Store Marker 1-8
 - SHIFT: Create Loop from current EditCursor position to Marker 1-8
 - SHIFT OPTION: Change Time Selection from current EditCursor position to Marker 1-8
 - SHIFT ALT: Same as Shift F1-F8
 - OPTION: Set Time Selection to Region 1-8
 - ALT: Set Loop to Region 1-8 (ALT and OPTION can be combined)
 - CONTROL OPTION: Store Time Selection as Region 1-8
 - CONTROL ALT: Store Loop as Region 1-8

6 Global Actions

Out of the box the eight buttons in the Global Actions section are without function. However, they can be used to trigger REAPER actions. To do so, the buttons must be assigned to those actions. They are called Global Actions, because in contrast to the actions that can be triggered via the VPOTS in the [Action mode](#) they are not dependant on sub-modes.



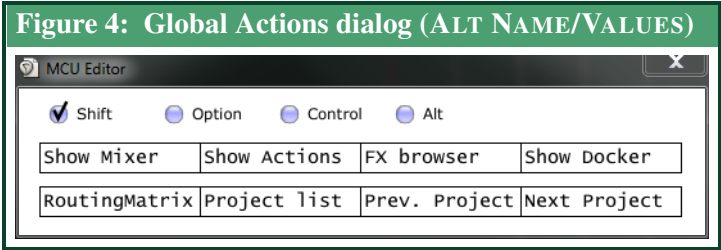
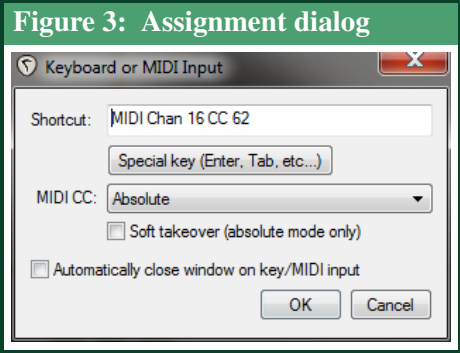
To assign an action (e.g. the “Item: Mute Items” action):

- open the Actions dialog (e.g. by pressing the '?'-key). You should get a window that looks like Figure 2.
- search the action you want to assign for example by using the Filter field at the top of the dialog
- select the action
- press the "Add..." button in the "Shortcuts for selected action" area of the Actions dialog.
- press the button in the Global View section that should trigger the action
- set "MIDI CC" in the Assignment dialog to "Absolute"
- now the dialog should look like the screenshot in Figure 3, although the MIDI event shown in the "Shortcut" field can be different (the event depends on the button you pressed)

A single button can be assigned to different actions, depending on the MODIFIER buttons that are pressed while the button in the Global View section is pressed (while assigning the action and when the action is triggered).

All MODIFIER buttons can be combined, so e.g. SHIFT + ALT + INPUTS⁸ triggers a different action than SHIFT + INPUTS. So 16 (all possible combinations of the MODIFIER buttons) * 8 actions (the eight buttons in the Global View section) can be triggered overall.

It is not easy to memorize 128 actions, but you can use the MCU display as a kind of notepad. When you press the NAME/VALUES button, the display switches to a text that you can enter in the Global Actions editor, that can be opened via ALT NAME/VALUES.



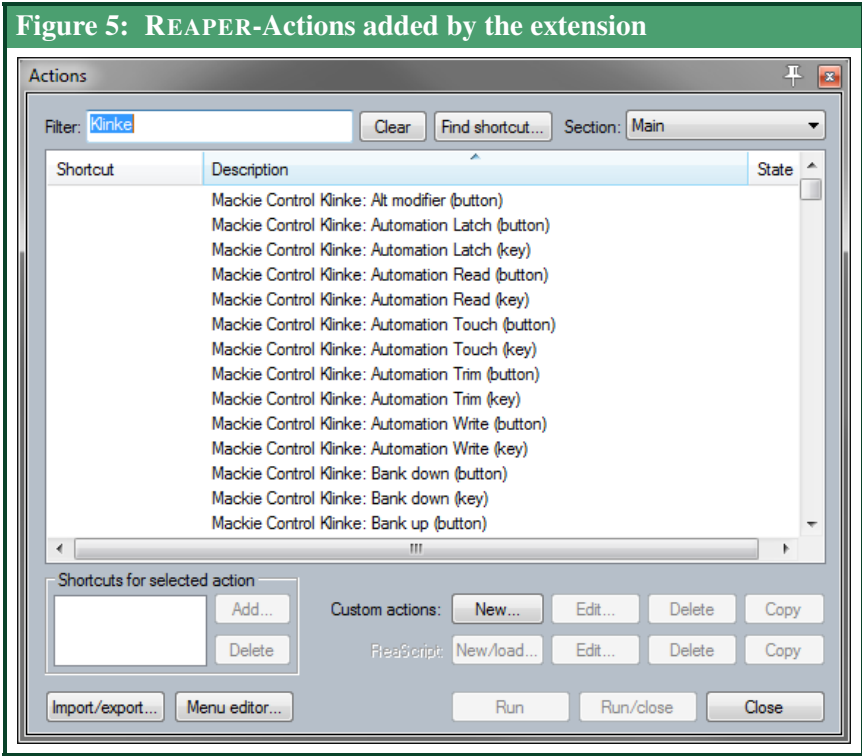
A different text can be entered for each modifier combination. Use the modifier checkboxes at the top of the editor to select the modifier combination for which the text should be edited.

6.1 Button-emulating actions

The previous section described how REAPER-Actions can be triggered by the MCU. But it is also possible to use the REAPER-Action system to “trigger” the buttons of the CSurf_MCU_Klinke. Of course when a REAPER-Action is used the buttons are only pressed virtually, but for the

⁸One of the buttons in the Global View section.

CSurf_MCU_Klinke extension this doesn't make any difference. This feature allows owners of hardware that has not the same hardware as the Mackie Control to "extend" their hardware either with keys from a computer keyboard or with other MIDI hardware like the Korg nanoPAD.



How does this work? Figure 5 shows the action dialog with the action filter set to "Klinke". As you can see, all actions begin with the String "Mackie Control Klinke", followed by the name of a button of the Mackie Control. The action descriptions end either with "(button)" or "(key)". You can assign these actions as described in section 6, the only difference is, that you don't press a button of the Global View section on the CSurf_MCU_Klinke, but a button on a different MIDI controller or a key on your computer keyboard.

So what is the difference between the "(button)" and "(key)" variants of those actions? As mentioned, an action simulates that a CSurf_MCU_Klinke buttons is pressed. A CSurf_MCU_Klinke button does also send an event when a button is released, so this must be simulated also. But e.g. the release of a computer keyboard key doesn't send any event is is therefore not recognized by an action that is assigned to this key. So the "(key)" variant automatically send also the release event directly after the press event. The "(button)" variant waits after the press event till the action is triggered again and then sends the release event. Most MIDI controllers sends an event when a button on the controller is released, in this case they should be assigned to the "(button)" variant. Computer keyboard keys and MIDI controller buttons that only send an event when the button is pressed should be assigned the "(key)" variant.

For some buttons like the "Alt modifier" only the "(button)" variant exists. For those buttons it's important that they are hold for a given time, so that the "(key)" variant is not useful. But you

can also assign keys to the “(button)” variant, in this case the button is virtually hold till you press the key for the second time.

7 Channel Strip modes

The Channel Strip section has different modes, which can be selected with the six buttons in the VPOT ASSIGN section.

To switch the modes, press the corresponding VPOT ASSIGN button. When a channel strip element is used while the VPOT ASSIGN button is pressed, the original mode will be restored after releasing the VPOT ASSIGN button. E.g. when the current mode is the SEND mode, you can press and hold the PAN/SURROUND button, use the SELECT buttons of the channel to select a different channel and release the PAN/SURROUND button to edit the send levels of this channel.

The LED of the VPOT ASSIGN button flashes when the mode corresponding to this button is activated. If it makes sense to select a mode the LED is turned on. For example when only one track is selected and it contains an FX, the LED of the PLUG-IN button is turned on. The Plug-, Action- and Pan-Mode come with a separate editor. The editor can be opened by pressing ALT and the corresponding VPOT ASSIGN button.

The Plug-, Action- and Pan-Mode also come with mode specific options⁹ that can be changed with the VPOTS while pressing the OPTION button (SHIFT + OPTION displays additional options). While you press the OPTION button you will see that the MCU display switches. It will show you up to four properties. In the upper row you will see the behavior you can change, in the lower row you will see the current behavior. You can select the behavior with the VPOTS. Pressing the VPOT on the left below an option selects the previous option, pressing the VPOT on the right below selects the next option. Alternatively, you can just turn the VPOTS. These options work on a global, not a project-dependent basis.

7.1 Pan-Mode

The extended version of the behaviour of the MCU plugin that comes with REAPER is called Pan-Mode and can be selected by pressing the PAN/SURROUND button. The Fader and the VPOTS, MUTE and SOLO buttons should be self-explanatory with the exception that double-clicking SOLO can be used to solo the track exclusively. The other functions are:

- VPOTS: Change the pan of the track
- REC: Arm Track on/off
 - SHIFT: Monitor on/off. As long as SHIFT is pressed the REC button LEDs show the Monitor status (On = monitoring is active)
 - OPTION: Rec Mode Input/None. As long as OPTION is pressed the SOLO button LEDs are show the Rec Mode status (On = Rec Mode is set to Input, Off = all other settings)
- SELECT: Select a track and deselect the other tracks
 - CONTROL: Add the track to the tracks already selected.

⁹The Action- and Pan-Mode options are the same.

- SHIFT: Select all tracks from the selected track to the track selected before (via the MCU). So CONTROL & SHIFT has the same behaviour as using the Control & Shift key while selected track using the mouse in REAPER.
- ALT: Same as SHIFT, but only the tracks that are accessible via the MCU are selected. See section [Trackfilter](#) for details.
- press and hold: If the [Folder mode](#) is activated and the track has children, use the track as root track. See [next section](#) for details.
- ◀ BANK ▶: Show the previous/next eight¹⁰ tracks on the MCU
- ◀ CHANNEL ▶: Show the previous/next track on the MCU
- GLOBAL VIEW: If the [Folder mode](#) is activated and the track has a parent track the LED is switched on and when the button is pressed, the parent track is used as root track. See [next section](#) for details.
- FLIP: Flip volume and pan (use the FADERS to change the pan, and the VPOTS to change the volume)
- MASTER FADER: Change the master volume

7.1.1 Folder-Mode

By default the folder structure of REAPER is not reflected on the MCU. However, it is possible to change this via the Folder-Mode Property in the [Pan-Mode Options](#). When the Folder mode is activated, the tree-like structure of the tracks in REAPER is reflected on the MCU and you only see the children of a track and, if desired, the parent of these children. The idea behind this is that the folder structure corresponds to sub-mixes, and you can easily select and work on a single sub-mix or go back a step and mix only on the level of the sub-mixes. This can improve track navigation a lot.¹¹ When you switch to Folder-Mode, only tracks are shown that have the Master track as their root. For all tracks that have children, the LED below the VPOT is illuminated. You can select these tracks as a new root track by pressing the corresponding SELECT button for longer than one second. To move back to the root track, press the GLOBAL VIEW button.

7.1.2 Editor

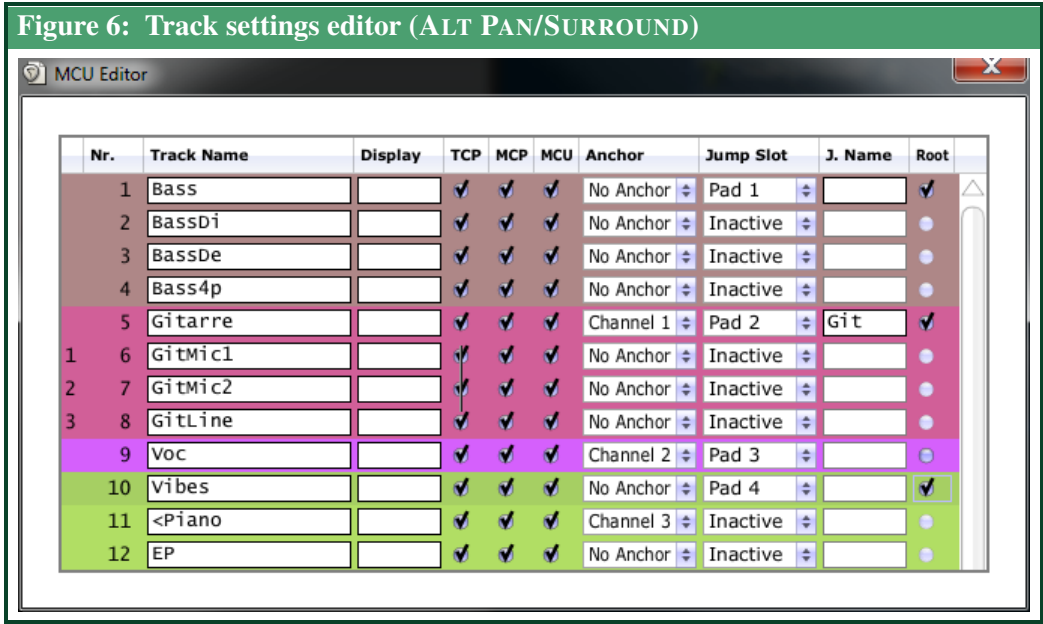
Before other concepts are introduced, it is useful to take a look at the [Track Settings Editor](#) in Figure 6.¹² You can open this editor by pressing ALT PAN/SURROUND.

The table rows represent the tracks of the current project. The leftmost column shows the Channel Strip that controls the track (if any). In the “Nr.” column the track number as defined in REAPER is shown. TCP and MCP are equal to the “Show tracks in track list” and “Show tracks in Mixer” settings in REAPER. The other columns are explained in the following sections.

¹⁰When Anchors are activated: the previous/next eight tracks minus the number of Anchors.

¹¹Theoretically, you can create a structure with 584 tracks and each track is no more than five clicks away. Or in combination with the [Quick Jump](#) feature, no more than three click.

¹²To save space, the screenshot displays less tracks than the real editor.



7.1.3 Track Names

Before v0.8, the name shown on the MCU was just the first six characters of the track name in REAPER. This has been improved, the name is now derived using the following rules:

- When a name is given in the Display column, this name is used for the MCU display
- When no name is given but the track name contains the character '|', the first six characters after the | are used
- If neither is the case, the first six characters of the track name are used

7.1.4 Track Filter

With the “Show” Property in the [Main Options](#) you can limit the MCU-accessible tracks to different sets. Some of these sets are defined via the REAPER GUI, like tracks with sends, or tracks that are also shown in the REAPER mixer. However, you can also define a CSurf_MCU_Klinke specific set, so that the tracks shown on the MCU are independent of any setting in the REAPER GUI. To do this, set Show Property to “MCU Set” in the [Track settings editor](#) and select the tracks that should be accessible in the “MCU” column.

7.1.5 Anchors

A Channel Strip can be attached to a track, so this track can always be controlled via the same fader etc., independent of the track navigation via the < BANK > and < CHANNEL > buttons. To attach a track, select one of the eight anchors in the Anchor column of the [Track Settings Editor](#). For example in the screenshot the track number 9 “voc” is always accessible through Channel Strip 2. This is also the case when the [Folder-Mode](#) is active, so that anchor tracks are shown on the MCU even when they are not part of the sub-mix displayed.

I suggest avoiding gaps between anchored Channel Strips because otherwise navigation throgh tracks can get confusing.

It is possible to turn off all anchors via the “Use Anchor” Property in the [Main Options](#), in which case the settings in the [Track settings editor](#) will be ignored.

7.1.6 Quick Jump

To simplify navigation, you can define up to eight tracks that can be set to the leftmost Channel Strip (the one that is not used for an Anchor track) quickly, followed by the other tracks as usual. To activate the Quick Jump feature, press and hold the PAN/SURROUND button. The display will show the names of the targets tracks (called Pads). The track can then be selected by pressing the corresponding VPOT.

The three rightmost columns in the [Track Settings Editor](#) are used to define the Pads for this purpose:

- Jump Slot: This column determines the tracks which can be selected as leftmost shown tracks.
- J. Name: If empty, the name displayd will be the same as the track name. It can be useful to replace the track name by a different name in the Quick Jump display. E.g. if the track is named “BD” and the following tracks are named “SD”, “Hi Hat” etc., you can overwrite the “BD” text in this column with “Drums”. When you select the “Drums” Jump Slot, you will get the “BD” track at the leftmost position on the MCU.
- Root: This checkbox plays only a role when the [Folder-Mode](#) is active and the track has children. If this is the case and the Root checkbox is set, the track will be used as the new root track, so that all the children will be shown. If the checkbox is not set, the track and other tracks on the same level will be shown instead. This is also reflected in the MCU display, Root jumps are shown in the upper row, “normal” jumps in the lower.

7.1.7 Options

Table 1 shows the Main Options of the Pan-Mode which already explained in the sections before.

Table 1: Main Options in Pan-Mode and Action-Mode (OPTION)		
Property	Setting	Description
Show	all	show all tracks on the MCU
	Mixer	show only the tracks on the MCU that are also shown in the REAPER mixer
	TCP	show only the tracks on the MCU that are also shown in the TCP
	MCU	show only the tracks on the MCU that are selected in the MCU row of the Track settings editor
Folder-Mode	sends	show only the tracks on the MCU that contain sends
	receives	show only the tracks on the MCU that contain receives
	flat	ignore folder structure and show all tracks side by side
	only children	reflect the folder structure, show only the children of the root track
	incl. parent	reflect the folder structure, show the root track and his children
Use Anchors	off	ignore Anchors
	on	activate Anchors

The 2nd Options are shown in Table 2. They allow to synchronize the tracks in the TCP/mixer to the tracks shown on the MCU, or, in the case of the TCP, only the tracks are shown that are selected.

Table 2: 2nd Options in Pan-Mode and Action-Mode (SHIFT OPTION)		
Property	Setting	Description
Adjust TCP	don't adjust	don't modify the shown tracks in the TCP
	hide non MCU	show only the tracks in the TCP that are also shown on the MCU
	only selected	show only the tracks in the TCP that are selected with the MCU
Adjust Mixer	don't adjust	don't modify the shown tracks in the Mixer
	hide non MCU	show only the tracks in the Mixer that are also shown on the MCU
Follow REAPER	no	The accessible tracks at the MCU can be only changed via the MCU itself.
	yes	When a track in REAPER is selected, that isn't accessible via the MCU the accessible tracks are adjusted so that the selected track is one of the accessible tracks.
Touch select	no	don't send an additional action after selecting a track via the MCU
	yes	send a "Track: Set first selected track as last touched track" action

7.2 Action-Mode

The button EQ in the VPOT ASSIGN section switches the VPOTS to the Action-Mode, the other elements of the channel stripes will work in the same way as in the Pan-Mode.

For the Action-Mode it is useful to import Action assignments as described in the [Installation](#) section. When you have done this, you can use the VPOTS in the Action-Mode to trigger REAPER-Actions, e.g. moving items etc. How does this work? The MCU sends different MIDI-CC message to REAPER when pressing a VPot, releasing it and moving it to left/right in a pressed or unpressed state, so there are six different CCs per VPOTS. In combination with the SHIFT modifier, you get six additional CCs. As described in the [Global Actions](#) section, you can assign those MIDI events to REAPER actions.

There are eight banks which can be assigned to different actions (the imported shortcuts using only four of them). To switch to a different bank, press and hold the EQ button again while you are in the Action-Mode. The display will show the name of the banks and you can select one by pressing the corresponding VPOT.

Of course you can add and change the display text for the banks and actions, ALT EQ opens the [Action-Mode editor](#).

Additionally the Action-Mode also supports "(midi cc only)" actions. Therefore you can enable in the [Action-Mode editor](#) the "Relative Mode", then the CCs that are send to REAPER are "Relative 2" instead of "Absolute".

In this case you must set the MIDI CC : field in the REAPER assignment dialog to "Relative 2", as shown in Figure 8.

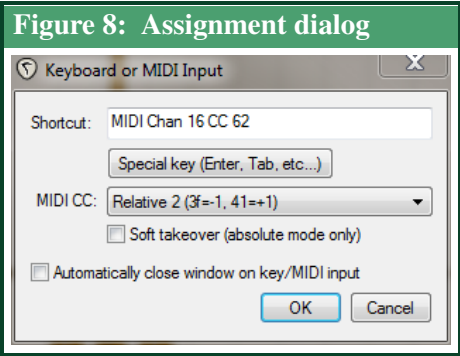
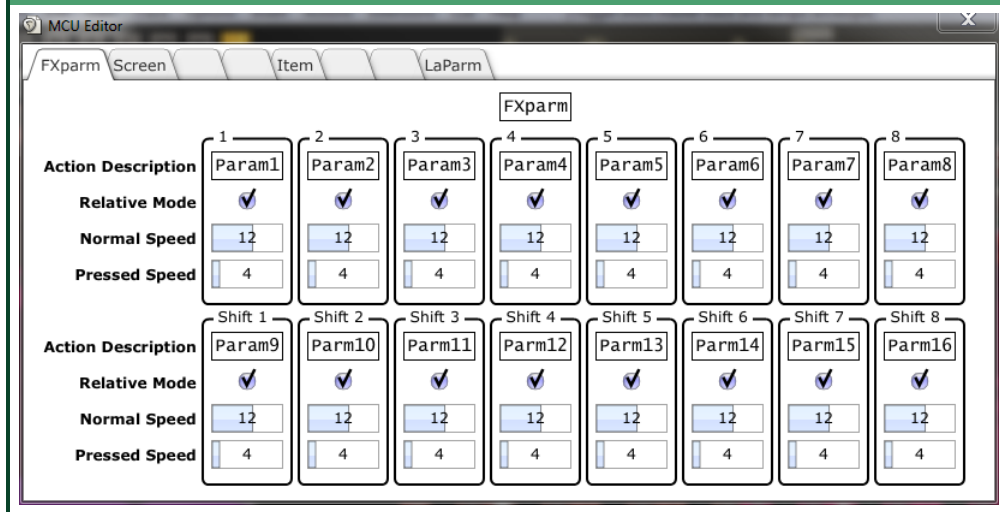


Figure 7: Action-Mode editor (ALT EQ)

In “Relative Mode” you can set the rotation speed via the “Normal Speed” and “Pressed Speed” settings.

The normal speed is used when the VPOT is not pressed while rotating, the pressed speed when the VPOT is pressed. For example this is used in the imported assignments in the FXparam bank to realize fine adjustment while pressing the VPOTS. The speed is set to 12 in “Normal Speed” and 4 in “Pressed Speed”.

7.3 Send-Mode

In the Send-Mode the Channel Strip Section controls the sends of the selected channel (only the sends of one channel can be controlled at one time). You can also press the SEND button twice to show the receives instead of the sends of the selected tracks.

- VPOTS: Change the send pans (or send volume, see FLIP)
- SOLO: Switch the send between mono and stereo
- MUTE: Mute the send
- SELECT: Select the corresponding track and show the receives/sends of the now selected track instead of the sends/receives
- FADERS: Change the send levels (or send pan, see FLIP)
- MASTER FADER: Change the volume of the selected channel
- FLIP: Switch the functionality of the FADERS and VPOTS

7.4 FX-Mode

The FX-Mode allows you to edit FX parameters. To structure the huge amount of parameters that a FX can have, the parameters are divided into "Banks" and "Pages". Each Page can control up to 16 parameters (8 with the FADERS and 8 with the VPOTS), and each Bank contains 8 Pages. A map consists of 8 Banks.

The parameters mapped to FADERS are controlled as continuous parameters (like e.g. thresholds, frequencies, etc.), the parameters mapped to VPOTS are handled as discrete parameters with a limited number of values (e.g. for On/Off buttons or the selection of a Waveform). The FLIP button bypasses the FX, the master fader controls the Dry/Wet level.

For many FXs, maps are installed in the MCU subfolder of the REAPER plugin folder (see 2). In the following description, these are called "factory maps". However, you can also create your own maps for the selected FX using the Mapping editor (see section 7.4.4 for details). If no map exists for a FX, a mapping is created automatically. In this case all parameters are processed as continuous (so that the VPOTS are unused for FXs without user created maps).

7.4.1 Navigation

A Bank is selected by pressing the SOLO buttons, a Page by pressing the MUTE buttons. The SOLO/MUTE LED flashes if the corresponding Bank/Page is selected, it illuminates, if the Bank/Page contains parameters that can be controlled, or is off if neither is the case.

An FX can be selected by pressing the PLUG-IN button of the VPOT ASSIGN section a second time. Then the names of up to six FXs are displayed and can be selected by pressing the corresponding VPOT. The two other VPOTS allow you to scroll through the FXs. An FX can also be selected by pressing the SELECT buttons. They select one of the first 8 FXs, or, when pressed in combination with the SHIFT modifier, one of the FXs 9-16.

7.4.2 Favorites

By default, you can only control an FX of the selected track. If you select another track, the FX that was selected in this track will get the focus again. By pressing the GLOBAL VIEW button, this connection between Tracks and controlled FX can be broken, the controlled FX will stay fixed until a different FX is selected manually.

In this GLOBAL VIEW state it is possible to store and recall an FX as a favorite. To store the FX press CONTROL SELECT, to recall it SELECT only (so an FX that is not a favorite can only be selected via the VPOTS, see section above). With the SHIFT button you get eight additional slots, so you can store up to 16 favorites.

7.4.3 FX Presets

The REC buttons can be used to store FX presets. An FX preset is a collection of all parameter-values of parameters that are mapped to a FADER or VPOT plus the dry/wet and bypass setting. The REC button defines the preset number (e.g. the REC button of Channel Strip 3 is used to store or recall preset 3). Presets are bound to an FX instance and can not be copied to a different FX instance.

To store a preset, press CONTROL REC. As for the [Favorites](#) you can use the SHIFT modifier to store 8 additional presets. To recall a preset press the REC button only. It is possible to store and recall presets for all FXs of a track at once, to do this double-click the REC button. You can use this

to compare settings that involve more than one FX, or to compare two different FXs by bypassing the first when you store the preset 1, and bypassing the second FX, when you store preset 2.

The LED of a REC button is illuminated if a preset is stored in this position, or it flashes when a preset is stored or recalled without changing a parameter afterwards.

The ALT modifier allows you to perform blind-tests. As long as you press the ALT modifier the control surface will not update it's FADERS and LEDs to the selected preset. When you press a REC button while holding ALT, a random preset for the FX will be selected (so it does not matter which REC button is pressed). Double-clicking a REC button also allows you to select a random preset for all FXs of a track, whereby the preset number will be selected from the existing presets of the selected FX (if another FX of the track does not have a preset in this position, it will not change its state).

Presets can be deleted. When you have a lot of presets with many parameters, this can slow down actions like “add track”. To delete a preset, press the OPTION modifier while pressing the corresponding REC button. If you double-click the REC button, the corresponding presets of all FXs will be deleted. To delete all presets of the FX also press the ALT button. Double-clicking the REC button will extend this to all tracks, so that all FX presets in the track will be deleted.

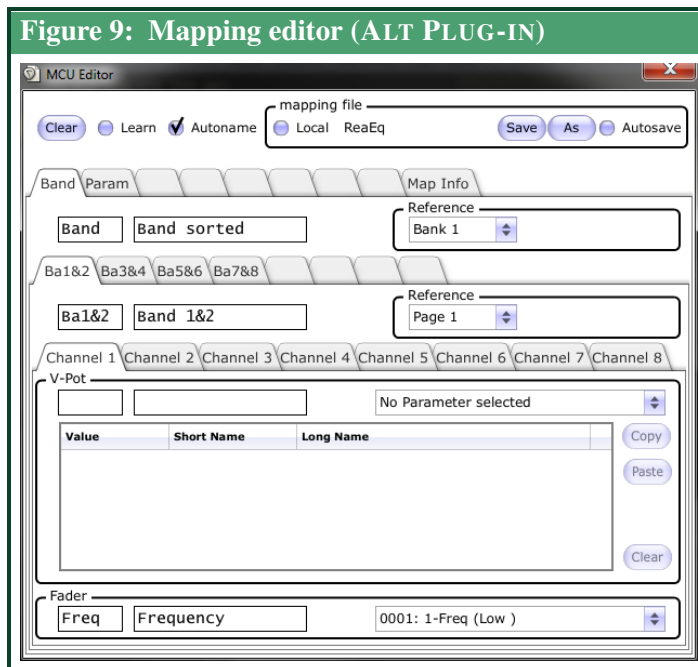
7.4.4 Map Creation

You can create your own maps can with the [Mapping editor](#) which can be opened via ALT PLUG-IN. The editor has a lot of tooltips. However, an additional help might be the screencast I made as an example of how to create a map: <http://tinyurl.com/33bt7a>.

When an FX is selected via the MCU or the name of the selected FX is changed in the Track FX dialog, a map is loaded if it's name is part of the FX name. E.g. if the FX name is "VST: ReaEQ (Cockos)" and a map "ReaEQ" exists, this map will be loaded. First the user-created maps ¹³ are matched, if no map is found there, the installed factory maps are searched through. So you can modify a factory map and store it with the same name, afterwards the modified version will always be loaded.

A mapping can be stored using the “save” button at the top of the editor. To avoid ambiguity you can not save a map with a name that contains the name of an existing user map or that is part of an existing user map. The “save” dialog will only al-

Figure 9: Mapping editor (ALT PLUG-IN)



¹³Which are stored in the My Documents/MCU/PlugMaps/ folder.

low you to save maps with unambiguous names, but it is best not to rename files in `My Documents/MCU/PlugMaps/`.

When an FX is inserted or selected, the corresponding map will be loaded automatically. The FX is matched to the maps using the FX name in the FX: Track window of REAPER. It is important to keep in mind that FX maps are not cached in the memory (except **Local maps** which are explained in the next section). So if you edit a map and then select a different FX, these changes are lost. When you start to work on a map, it is a good idea to save an empty map and activate the Autosave option in the Mapping editor (you must save the map first, so that the Autosave function knows a filename). When Autosave is enabled, the map will be saved automatically when you select a different FX.

If a map is named as the FX, no further steps are needed after inserting the FX, but if you load a plug-in like Reaktor for which you need different maps depending on the instrument/effect you are loading in Reaktor, you must add the name of the map to the FX name. In that case you can save the plug-in/content setup as an FX chain to avoid this step. An example is given in this screencast: <http://tinyurl.com/35kuglx>

7.4.5 Local Maps

Normally a saved change in a map will automatically be used for all FX instances with matching names. This can be a disadvantage if you want different maps for the same FX, e.g. if you use the IX/Mixer FX and want to rename the parameters so that they describe the signal, instead of using just the default “Level x + y (dB)” names. The solution is to create a Local map.

You can do this via the Mapping editor. In the mapping area at the top is a checkbox called “Local”. If this checkbox is selected, the map of this FX instance is independent of the map of other instances and stored in the REAPER project file and not a separate file in the `PlugMaps` folder.

7.4.6 Sync with REAPER GUI

The default behaviour for syncing the MCU with the REAPER GUI is as follows:

- When you select a different FX in the FX chain of the track that is selected with the MCU or open a new floating window of a FX from the selected track, the MCU also jumps to this FX.¹⁴
- When you select a different FX with the MCU and the REAPER FX chain window of the corresponding track is visible, the FX will also be selected in the FX chain window. This can be avoided by pressing `OPTION` while selecting the FX.

This behaviour can be changed, see Table 3 and Table 4 for details.

7.4.7 Summary

- VPOT: Control discreet parameters. You can select the next value by pressing the VPOT. In combination with `SHIFT` you select the previous. If it was the highest value, you will jump

¹⁴With the exception of when the favorite mode is active (= GLOBAL VIEW LED is lit).

Table 3: Main Options in Plug-Mode (OPTION)		
Property	Setting	Description
MCU follow	off	the MCU controlled FX can only be changed via the MCU itself
	same track	the default behavior as described above
	always	the MCU always keeps in sync with the last selected FX in the GUI, even if the FX is on a different track or the favorite mode is active
GUI follow	off	CSurf_MCU_Klinke never modifies the REAPER GUI
	if chain open	the default behavior as described above
	open chain	same as "if chain open", but also opens an FX chain window, if none exists ^a
	open floating	opens a floating window of the selected FX
ALT SELECT	open chain	when you press a SELECT button while holding ALT, the FX chain window will be opened
	-float	as above, but also all floating FX windows will be closed
	open float	a floating window of the selected FX will be opened
Limit float	off	don't limit the number of floating FX windows
	only 1 MCU	when you open a second floating window using the MCU, the first will be closed, but you can still open additional floating windows via REAPER
	only selected	only the plug-in that is controlled by the MCU can have a floating window, all others will be closed. ^b
	only chain	no floating windows can be opened, instead you will always get a FX chain window
^a depending on the REAPER properties, this could also close the "old" FX chain window		
^b this will automatically set the "MCU follow" option to "always"		

Table 4: 2nd Options in Plug-Mode (SHIFT OPTION)		
Property	Setting	Description
Mode change	off	don't modify the windows when you en-/disable the Plug-Mode
	show/hide wnd	when you enter the Plug-Mode, a window for the controlled FX will be opened. ^a When you leave the Plug-Mode, all FX windows will be closed. same as "show/hide wnd", but also calls a "View: Toggle Mixer visible" action after closing the windows ^b
	s/h wndlmixer	
Move top left	off	don't move a floating window when it is opened
	on	when a floating plug-in window is opened, it will be moved to the top left position of the leftmost monitor
^a the window type depends on the "GUI follow" option		
^b this can be useful when you work with docked FX chains and also have other views docked beside the mixer		

to the lowest (e.g. if only two values exist e.g. Off and On, you will toggle between off and on by pressing VPOT). Rotating the VPOT works nearly in the same way, but does not jump from the highest to the lowest value (so in the example given above you could turn the VPOT to the right as long as you wanted, and would get only the On state).

- REC: Recall an [FX preset](#)
 - SHIFT¹⁵: Access FX preset 9-16
 - CONTROL: Store an FX preset
 - OPTION: Delete an FX preset

¹⁵All of these REC modifiers can be combined.

- ALT: Recall a random FX preset, or in combination with OPTION: Delete all presets of the FX
 - Double-click: Extend action to all FXs of the track
- SOLO: Select a Bank
- MUTE: Select a Page.
 - SHIFT In all Banks the Pages at this position are selected
- SELECT: Select an FX of the actual track (if the GLOBAL VIEW is off) or a Favorite (else).
 - CONTROL: If Favorites mode is active: store a Favorite.
 - SHIFT: Access FX or Favorite 9-16.
- ◀ BANK ▶ Select previous/next Bank
- ◀ CHANNEL ▶ Select previous/next Page
- GLOBAL VIEW: see SELECT
- FLIP: Bypass
- MASTER FADER: Control Dry/Wet level.
- Double-click (and hold) NAME/VALUES: Show all parameter values in the display.

8 Misc

- SHIFT ZOOM: Zoom out project
- CYCLE: Toggles Repeat
- DROP: Toggles Record Mode ¹⁶
 - LED off: "Record mode: normal"
 - LED on: "Record mode: time selection auto punch"
 - LED flashing: "Record mode: auto-punch selected items"
- CLICK: Toggle Metronom
- SOLO¹⁷: If the master channel is muted (the Solo LED flashes in this case) it unmute the master channel, otherwise all tracks are unsoloed
- When an Automation Mode button is pressed in combination with Control, the Mode is set for all tracks

¹⁶Please be aware that CSurf_MCU_Klinke resets the Record mode to normal at initialization of the MCU and that changes made in REAPER itself are not reflected by the MCU and will be overwritten when the Record button on the MCU is pressed.

¹⁷The SOLO button above the Transport section.

9 Overlay

You can find templates for creating MCU Overlays in the Overlay subfolder of the installed MCU folder. The templates were created by Chris Doerman (for version 0.6) and are also discussed in this thread: <http://forum.cockos.com/showthread.php?t=41973>

10 For Experts ;-)

10.1 Editing the VPOT Values Manually

The parameter map editor does not allow to edit the different values for the VPOT manually, the values can only be learned. In some cases this can not be done. But you can edit the XML file directly, which is not so complicated. For example, if you open the Tin Man map, you will find something like:

```
<VPOT short=" oink" long="filter type" paramId="2" ver="1">
  <STEP value="0" short="all pa" long="all pass"/>
  <STEP value="1" short="low pa" long="low pass"/>
</VPOT>
```

You can copy, paste and edit STEP lines to edit the table, only these lines must be edited. E.g. if you need an additional filter type you can modify this lines to:

```
<VPOT short=" oink" long="filter type" paramId="2" ver="1">
  <STEP value="0" short="all pa" long="all pass"/>
  <STEP value="0.33333" short="high" long="high pass"/>
  <STEP value="0.66666" short="band" long="band pass"/>
  <STEP value="1" short="low pa" long="low pass"/>
</VPOT>
```

The difference between the value in the XML-file and the correct value must be lower than 0.001.

11 Disclaimer

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